AMENDMENTS TO THE CLAIMS:

Please cancel without prejudice claims 2 and 3, amend claims 1 and 4-7 and add newly written claims 28-31 as follows.

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (currently amended) A resonant magnetometer comprising:

an oscillatory member; and

means for passing an alternating current (AC) through said oscillatory member for imparting an oscillatory force on said member, ~~characterised in that~~wherein a driver is additionally provided to impart a magnetic field independent oscillatory force to said oscillatory member, said driver including an amplifier having an input based upon an output from a sensor, said sensor providing an electrical output signal dependent on the deflection of the oscillatory member, and wherein an alternating current is derived directly from the oscillation of the oscillatory member without using a separate frequency generator source thereby implementing a positive feedback self resonant drive signal to the oscillatory member.

2. (cancelled).

3. (cancelled).

4. (currently amended) A magnetometer according to claim ~~3~~1 wherein the driver provides an oscillatory force of fixed amplitude.

5. (currently amended) A magnetometer according to claim ~~3~~1 in which the driver is arranged to impart an oscillatory force to the oscillatory member of adjustable amplitude, wherein the amplitude of the oscillatory force applied by the driver is adjusted during use so as to maintain a given amplitude of oscillation of the oscillatory member.

6. (currently amended) A magnetometer according to claim ~~2~~1 wherein the means for passing an AC through the oscillatory member comprises a feedback circuit arranged to receive the electrical output signal produced by the sensor.

7. (currently amended) A magnetometer according to claim ~~2~~1 wherein the sensor comprises at least one sensor electrode located on the substrate and having a variable capacitance with the oscillatory member.

8. (previously presented) A magnetometer according to claim 7 wherein the sensor comprises a plurality of elongate sensor electrodes located on the substrate and the oscillatory member comprises a plurality of elongate electrodes interdigitated with said plurality of elongate sensor electrodes.

9. (original) A magnetometer according to claim 8 wherein the electrodes of the oscillatory member are maintained at a predetermined direct current (DC) polarisation voltage.

10. (original) A magnetometer according to claim 8 wherein a high frequency AC polarisation voltage is applied to the electrodes of the oscillatory member.

11. (previously presented) A magnetometer according to claim 8 wherein said plurality of sensor electrodes are electrically connected to form two electrode sets, the two electrode sets being arranged to provide differential capacitive pick-off.

12. (previously presented) A magnetometer according to claim 1 wherein the means for passing an AC through the oscillatory member includes means to vary the amplitude of said AC.

13. (previously presented) A magnetometer according to claim 1 wherein the driver comprises at least one drive electrode formed on the substrate to electrostatically impart the oscillatory force to the oscillatory member.

14. (previously presented) A magnetometer according to claim 1 in which the driver comprises a plurality of first elongate drive electrodes formed on the substrate and the oscillatory member comprises a plurality of second elongate drive electrodes, wherein the first elongate drive electrodes are interdigitated with the second elongate drive electrodes.

15. (previously presented) A magnetometer according to claim 1 wherein the oscillatory member comprises a resonant beam.

16. (previously presented) A magnetometer according to claim 1 wherein the oscillatory member comprises at least two flexible leg portions, said AC being passed through at least one of said at least two flexible leg portions.

17. (original) A magnetometer according to claim 16 wherein the oscillatory member comprises a substantially rigid cross-beam arranged substantially perpendicular to, and interconnecting, said at least two leg portions.

18. (original) A magnetometer according to claim 17 wherein the cross-beam comprises a plurality of elongate electrodes protruding perpendicularly therefrom.

19. (previously presented) A magnetometer according to claim 17 wherein the means for passing an alternating current (AC) through the oscillatory member is arranged to supply a differential AC voltage to said leg portions such that said cross-beam receives the desired polarisation voltage.

20. (previously presented) A magnetometer according to claim 1 wherein the oscillatory member is arranged to oscillate along an axis in a plane parallel to the plane of the substrate.

21. (previously presented) A magnetometer according to claim 1 wherein the oscillatory member comprises at least one stress reliever.

22. (previously presented) A magnetometer according to claim 21 wherein the at least one stress reliever comprises a stress relief loop.

23. (previously presented) A magnetometer according to claim 1 wherein said magnetometer is formed as a micro-electromechanical system (MEMS).

24. (previously presented) A magnetometer according to claim 1 wherein said substrate and oscillatory member comprise silicon.

25. (original) A magnetometer according to claim 24 wherein said substrate and oscillatory member are formed from any one of a silicon-on-insulator (SOI) wafer and a silicon-on-glass (SOG) wafer.

26. (previously presented) An inertial measurement unit (IMU) comprising at least one magnetometer according to claim 1.

27. (original) An IMU according to claim 26 wherein three magnetometers are provided, each of the three magnetometers being arranged to detect magnetic fields along mutually orthogonal axes.

28. (new) A resonant magnetometer comprising an oscillatory member and means for passing an alternating current (AC) through said oscillatory member, wherein a driver is additionally provided to impart a magnetic field independent oscillatory force to said oscillatory

member, the magnetometer further comprising a sensor for providing an electrical output signal dependent on the deflection of the oscillatory member, the sensor comprising a plurality of substrate electrodes comprised of elongate sensor electrodes located on a substrate interdigitated with a plurality of oscillatory member electrodes comprised of elongate sensor electrodes on said oscillatory member, said substrate electrodes and said oscillatory member electrodes comprising a variable capacitor.

29. (new) A magnetometer according to claim 28 wherein the electrodes of the oscillatory member are maintained at a predetermined direct current (DC) polarisation voltage.

30. (new) A magnetometer according to claim 28 wherein a high frequency AC polarisation voltage is applied to the electrodes of the oscillatory member.

31. (new) A magnetometer according to claim 28 wherein said plurality of sensor electrodes are electrically connected to form two electrode sets, the two electrode sets being arranged to provide differential capacitive pick-off.